Industrial FINISHING

Reg. U. S. Pat. Office

Devoted to Product Finishing in the Factory

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Letters from Readers of "Industrial Finishing"

The names and addresses of firms or individuals whose letters and inquiries appear in this department may be had by writing this office, or letters addressed to them in care of this office will be forwarded promptly.—The Editor.

Casket Handle Finish

There has recently been introduced in the casket trade a finish resembling enamel, but chip proof and very durable. Pastel shades are available in the material in question. We desire to obtain the material and would like to know where we can buy it.—R. Casket Co.

Flock-Backed Mirrors

We are interested in a certain kind of spray to take the place of felt on the backs of mirrors. Kindly write or have a representative call regarding information on same.—T. Mirror Works (Glass Tops for Furniture).

Heat-Resistant Enamels

Can you give us any information regarding enamels which are suitable for use under heat?

We have worked with various paint manufacturers, attempting to secure an enamel that could be used on products which are subject to a maximum of about 350° F. of heat. We have listened to the claims of various paint salesmen who state that their products will stand this temperature. However, our practical experience is such that we doubt their word very much.

We find that with certain enamels there is an almost immediate discoloration. This is usually of a browning nature. On others, it is of a progressive nature, that is, it occurs during the life of the product—usually over a period of several months or years.

We would appreciate any information you can give us regarding manufacturers of suitable enamels for this use. One requisite of these enamels is that they be made in a range of pleasing colors, such as normally used in the kitchen. We use considerable quantities of this type of material and would be pleased to hear from various manufacturers.—M. S. T. Co. (Electric & Steam Cookers).

Will you kindly advise us the name of the manufacturer of "Compo Impervious Paint" mentioned on page 38 of the June issue of INDUSTRIAL FINISHING? We would appreciate receiving this information as promptly as possible.—C. Mfg. Co.

EDITOR'S NOTE:—It's The Hildreth Varnish Co., Brooklyn, N. Y.

Will appreciate your advising where we can secure a heat-resisting white, preferably an air-drying enamel that will stand up to temperatures of about 350° F. We want this material for finishing electric stoves. . . . Have tried several materials but they have not been entirely satisfactory, changing to yellowish shade, killing gloss, and tending to blister; the work was properly cleaned and the material was applied as per instructions, but they just fall short of being satisfactory.

We are equipped to spray or brush. The drying time is not important. It looks as though some of the new synthetic gum materials should be just right for this work. If you know of any suitable materials, kindly advise us—N. O. H.

Finishing Aluminum

We have a problem in connection with finishing small aluminum pieces. These pieces have a very irregular shape and it is necessary that they be very smooth. It is impractical to

He cannot prevent rejects using an obsolete baking oven. Cooperate with him by modernizing your existing oven equipment or installing new ones.

Write us now for an appointment. Our experience is available to you without charge. Let us talk it over and see if we cannot save you a lot of trouble, and at the same time, give you a better, more uniform product at less cost.

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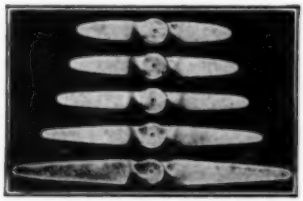

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polish them on the hard wheel and a wire wheel does not leave a smooth enough finish.

The source of trouble is small pit holes which drag out in polishing. We are wondering whether or not you could give us any information relative to how these pieces could be brought to a high finish. We have thought of coating them with some coating to produce the smooth finish, but have not been able to find a satisfactory coating. This coating must be heat proof and stand sulphur, ammonia and acetic acid, and we have found that none of the lacquers meet these requirements, nor does Bakelite stand up for any length of time.

Another idea that we have had is that they might be burnished in a burnishing barrel, but any information you could give us along these lines would be greatly appreciated.—M. P. Co. (Molds for Rubber & Theroplastics).

To Keep Down Dust and Lint

In one of your last publications of INDUSTRIAL FINISHING, I believe within the last six months, there appeared an article relative to methods of keeping dust and lint from geting on work in finishing rooms. This article talked about the wearing of silk shirts by the men in the room, keeping the floors damp or oiled, and the type of wiping cloths to use, etc.

Unfortunately we do not seem to be able to locate the magazine this article was in, and it would be greatly appreciated if you would send a copy of this magazine or article, marked for the personal attention of the writer.—L. I. S. Co. (Lacquers & Chemicals).

Metal Cleaning: Rust

I've just finished reading the June and July issues of your good magazine. M. M. Miller's article on "Cleaning Metal Refrigerator Parts" and E. W. Windsor's article on "New Trends in Automotive Finishing" interest me very much.

Miller is certainly right when he says, ". . . . no metal . . . . product requires greater care in surface preparation, previous to painting, than do metal refrigerators." But it is obvious that there are many other metal products which now require proper cleaning and other surface treatment to rustproof and extend he life of the finishing material used.

Cleaning metal mechanically as well as chemically, as Mr. Miller im-

plies, is of vital importance to durable finishes. But, taking steps to prevent the formation of new rust beneath finishes on all sorts of metal products, is of even more importance. No finishing material is completely impervious to moisture; and most finishes are subjected to abrasions. This means that if rust does not form at the abrasion and creep under surrounding finishing material, it forms beneath the finish, largely because moisture seeps through it, causing progressive rust and corrosion and resulting in finish destruction.

I am very much interested in the subject of metal finishing.—M. N. R.

To Catch Waste Spray

We are sending you a sample of a small brass cup hook which we have lacquered in various colors by spraying. These cup hooks are mounted on sticks in rows of about 25 or 30 hooks. The spray gun is then applied from all sides, top and bottom. It becomes apparent, as you no doubt know, that by far more lacquer is wasted by not striking the hooks than what actually goes on the hooks. This results in enormous waste and naturally increase our cost.

We write to ask you whether you know or have heard of any apparatus that can catch this lost lacquer, so that it can be accumulated and used over again, thereby avoiding waste? If you are in a position to assist us regarding this matter it would be greatly appreciated.—P. C. S. Corp.

EDITOR'S NOTE: See the "What's New" section in this issue.

Acid-Proof Black

We are figuring on the construction of some science tables, the tops of which require a finish that is acid proof. The table tops are birch and they are to be finished a dull black. The tables are to be used in a high school chemistry and physics department. Can you furnish us with the names and addresses of concerns who can supply the proper material and instructions for its application?—H. W. S. (Specialties).

"Colorimeter" Improved

In reference to the write-up entitled "Colorimeter Checks Color Variations," as published in May issue, page 44, I wish to state that this in-

(Continued on page 53)

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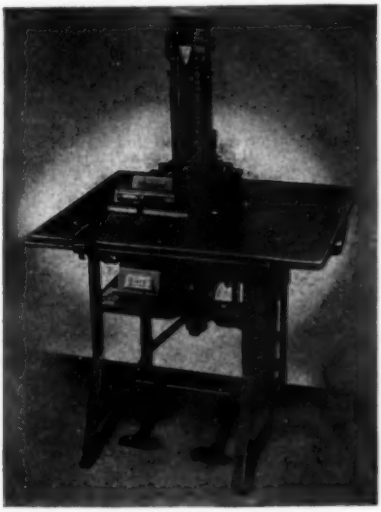

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Synthetic Resin Finishes

by C. W. Haynes
Director of Research for the
C. W. Haynes Laboratories, Inc.

This article, prepared and submitted at the Editor's request, reveals considerable timely and practical information about the new synthetic resin finishes, which are coming into usage in many industries.

THE WORD "synthetic," according to our friend Webster, means "All pertaining to or concerned with synthesis," and a modern synthetic finish is just that; a synthetic resin is 100% synthetic or man made. The word synthetic, however, is rather indefinite when applied to a finish, as some varnishes can as truly be called synthetic, as some of the so-called synthetic finishes offered as such. For purposes of this article we will assume that synthetic finish means the new type finish that has brought furrows to the brow of the manufacturer of lacquer and also the manufacturer of oil-type materials.

There seems to be a great deal of cloudiness in the mind of the user regarding synthetics. He is told that here is a new finish that is neither a lacquer nor an oil-base material such as a varnish or paint. "What is it, anyhow?" he asks, and then the salesman usually starts to surround his own particular finish with an air of mystery — possibly to cover his own ignorance or perhaps the shortcomings of his material.

What They Are Made of How They Are Made

Synthetics, as they were first known, were combinations of glycerine, with which we are all familiar, and phthalic anhydride, with which most of us are not familiar. Phthalic anhydride is made from napthalene, which is nothing more or less than the familiar moth balls or flakes, and has the appearance of a lot of needle-like, frosty crystals, such as are seen sometimes in the winter on the window pane. These two materials are heated for a certain period of time in a reflux condenser, which piece of apparatus is like taking a teakettle and stretching the spout out long enough so that the steam from the boiling water, instead of escaping as usual, will condense on the sides of the spout and run back into the kettle again. The reaction of these materials in this reflux condenser produces a tough, hard, durable, although somewhat brittle material when used as a synthetic finish by itself. It has become the custom, more or less, to refer to this type of material as an alkyd resin.

To attain greater toughness, gloss, durability, etc., this base material has been later modified with other materials such as the fatty acids of various drying oils, such as linseed and China wood; also semi-drying oils such as soy bean and other oils of the non-drying type like castor oil are used. Such a resin is known as an oil-modified, alkyd resin. To secure other qualities, such as quicker drying and faster baking, the alkyd resin is treated with phenol—carbolic acid to you. This class is known as a phenol-modified, alkyd resin.

Who Makes Them

Who makes these resins that require such close control and technical skill?

There are about five manufacturers of these basic materials (just as in the manufacture of nitrocellulose) who specialize in the production of these base materials only, and do not make the finished product. Thus the independent finish manufacturer is able to select the best products of each raw material manufacturer and so produce a superior finish.

Characteristics of Synthetics

Synthetics are characterized by a somewhat faster working schedule than varnish as far as the finisher is concerned. They air-dry out of dust in from ten minutes to four hours, and airdry hard in from two hours to overnight or more, depending upon their particular formulation, thickness of film, and on the use for which they are formulated. As a rule, the faster drying ones are not as tough or flexible as the slower drying. Thus, as far as the drying time is concerned, they are between a lacquer and a varnish, but nearer to a quick-drying varnish.

Most, although not all, of the synthetics will bake in a relatively short time and at a much lower temperature than any previous finishing materials, producing a tougher finish than the same material airdried. The usual time is from one-half hour for a quick-baking alkyd to two to three hours for a slow-baking one. The temperature employed is from 175°F. to 300°F., with the majority employing about 200°F. and baking for about one hour.

Synthetic Thinners

Whereas different types of alkyd finishes require different types of thinner, toluol or xylol will reduce all types of synthetics of the alkyd or modified-alkyd type. Some types will tolerate reduction with mineral spirits or V.M.P. naphtha to some extent, or in some cases (and they are usually the slower drying synthetics) all mineral thinner may be used. If mineral thinner or a thinner containing an appreciable amount of mineral thinner is used with a synthetic that requires the use of a thinner containing mostly toluol or xylol, a gummy mass is produced instead of a thinning action.

A word of caution should be given against having the thinner too strong a solvent, that is, containing too much toluol or xylol, as in cases where more than one coat is applied, the lifting of the undercoat sometimes occurs. The average user should use the thinner recommended by the manufacturer of that particular synthetic he is using. This is the rule much more so than in the thinning of lacquers. Synthetics generally require only a small amount of thinning for use.

Where to Use Synthetics

As a finish user, where can I use synthetics to an advantage?

Where a one-coat, high gloss, extremely durable finish is desired, synthetics stand out above either lacquer or varnish. Particularly is this so when they are applied to metal, as no primer should be necessary. Where time is a real factor, a short bake will suffice to render the film hard enough so that the articles may be packed as soon as they cool.

Synthetics produce a glossy surface even superior to an oil-type enamel, and hold their luster and toughness longer than oil enamels, and cover better than lacquers and are usually tougher, particularly on a metal and especially so when baked. They are displacing the use of lacquer in the finishing of automobiles and particularly automobile trucks which is their largest use at the present time.

Percentage of Solids

The percentage of solids, that is the percentage of actual film-forming material in synthetic resin finishes, runs a little less than oil enamel and about 25% to 50% more than lacquer. The cost of certain types of one-coat, durable, glossy finishes is less, using a synthetic material, than that of a lacquer, and slightly more than that of an oil enamel of like quality. In general they have much better gloss retention than either the varnish-type enamel or lacquer. Like other materials, however, they vary in durability from that of a medium grade varnish to and exceeding that of the highest grade varnish—and the purchaser should be assured that the grade he is buying is durable enough for his particular requirement.

Synthetics can be applied successfully by most of the methods in use, such as spray (both automatic and hand), dip (with some exceptions), roll, flow, tumbling, brushing, etc.

Some Disadvantages

Of course, every material has its disadvantages and we will here enumerate a few of the disadvantages of the alkyd-type material. When they do fail, the surface presents a sort of an alligator cracking appearance and consequently leaves a poor surface for refinishing. They must be applied in a thin film to dry through and through; if applied in a heavy film they sometimes take several days to dry, and also wrinkle very easily. In the case of an article which is subjected to sudden changes of temperature, they usually fail much quicker than other types of material. Synthetics have not as yet been produced so that their characteristics can be modified by the individual finish manufacturer to produce finishes that are unusually resistent to alkalies and acids, alcohol, continued emersion in water, and high degrees of heat.

Present and Future

The use of synthetic finishes is steadily increasing although at not as fast a pace as was the case, because like everything else they have their limitations and will never, in their present form, displace either lacquer or varnish to much more of an extent than they have at present. In several instances where they have displaced lacquer or varnish, we now find that they have been given up in favor of the original finishes. In general the synthetics have displaced lacquer to a greater extent

than oil enamels and varnishes, due to the fact that they give more gloss in one coat, with greater coverage per gallon, than do lacquers, and have higher luster and longer gloss retention, as well as quicker drying or baking than oil-type finishes.

Coating Spray Booth Interiors

RUBBER protective coatings for spray booths, resulting in important time and cost savings in the maintenance of such equipment, are included in the many industrial applications for "Kelsanite," a liquid rubber which can be handled like paint, has quick drying and curing properties, and is readily removable when desired.

Servicing spray booths has always been a problem in production industries. Generally such booths are coated with some form of highly adhesive grease, paper or composition material which is not easily removable. At the plant of Detroit Steel Products Corporation, where the accompanying photographs were taken, it required the time of three men for a whole day to clean two booths, the booths being cleaned once every four weeks.

Fig. 1—Applying the liquid Kelsanite to spray booth walls with a simple spray gun. In a few minutes after applying, the coating turns into live rubber.

Fig. 2—When the Kelsanited spray booth is to be given a new protective coating, the old Kelsanite is readily stripped off, as shown here. An air gun can also be introduced under the surface and the entire coating blown off.

In "Kelsaniting" the spray booths, simple spray equipment is used, as illustrated in Fig. 1. When the booth is to be cleaned, the Kelsanite can be removed either by stripping it off by hand as shown in Fig. 2, or by loosening the edges and inserting an air hose under the coating. With the latter method, the coating, although quite adhesive to the surface, can be blown off the spray booth walls, in the same manner that a balloon is inflated.

Binks Spray Catalog

A new, revised, 16-page, loose-leaf catalogue on spray painting equipment and accessories has been announced by the Binks Mfg. Co., 3114 Carroll Ave., Chicago, Ill.

An 18th Century Georgian group inspired by originals from the Metropolitan Museum of Art. All authentic reproductions. Photo, courtesy Kittinger Co., Buffalo, N. Y.

Show Furniture

by
Edw. F. Huffman

What styles, designs, finishes and colors predominated on new furniture exhibited at the Chicago and Grand Rapids Mid-Summer Markets.

AFTER THE large registration of buyers completed their investigation at the Mid-Summer markets in Chicago and Grand Rapids, they evidently returned Modern minded because this Modern style, commonly termed "American Modern" or "Modified Modern," led the field in style and design, there being twice as many suites shown at the current market as were exhibited last January, 1935.

Side Glances

A few side glances—to make a general survey—in the many spaces revealed: A decided return to English styles, as designated above, mostly in dining room suites; tops in either broken stripe or plain stripe mahogany veneer;

Georgian Period furniture holds sway in dining room suites . . . . with Chippendale, Adam, Sheraton, and Hepplewhite . . . . and selections from our only real American Period designer, Duncan Phyfe.

Modern styles predominate in bedroom suites. Walnut leads in the woods shown, followed by mahogany in the solid and in combinations of plain stripe, quartered and beautiful crotch figure veneers.

fronts of drawers and cases in either crotch of highly-figured swirl mahogany veneers, finished in mahogany's natural color—a deep golden brown, or rather a sherry or amber color.

Modern styles predominated in bedroom suits, with walnut in the solid, and in stump, crotch, and rotary veneers, cutting the widest swath in the many patterns shown. Generally a light finish was used on the solid and veneered walnut pieces, enhancing the inherent beauty of the natural wood. It is a natural brown color, warm and inviting. Paramount in the finishes used on walnut was lacquer rubbed to a velvety sheen, revealing the open tubes or fine pen lines so prevalent and distinctive in American black walnut.

Dining Room Furniture

Not as many dining room suites were shown in Modern as in the 18th Century style. One unusual Modern set showed a table top inlaid with large squares of figured rotary and stump walnut veneers; it looked like a large checker board. The finish was rubbed to a semi-gloss luster. The legs, stretchers and apron of this Modern dining table were of gum, finished in lacquer to closely imitate walnut—not highlighted but having a uniform semi-gloss luster.

The general trend in woods used for the Duncan Phyfe, Sheraton, and Chinese Chippendale is toward genuine mahogany. Figured mahogany veneers, amazing in their variety and beauty, ranged from the simple straight stripe, on the tops of buffets and tables, to the rich, complex, mottle figure (or crotch, swirl, etc.) on the fronts of drawers and cases . . . . finished natural, that is a deep, golden brown.

Bedroom Furniture

Few novelty colors were shown; a strong return to the commercial side of bedroom manufacture was evident. Several prominent Southern manufacturers showed highly ornamented patterns (commonly called "Borax") with heavy 6½-in. turned head and foot board posts in gum, finished in semi-gloss walnut . . . . highlighted at the extreme point of the swing of the bead, cup or vase turnings. A few high-priced suites were shown in rotary, birdseye-figure maple veneer—water-stained and hand rubbed to moderate gloss finish—in the natural color in one instance, and a little bit darker than natural maple in another.

True-circle mirrors were as outstanding and as prominent as the English period styles, or the Modern or commercial types. It is evident, that this type of mirror will lead the field for style and design for the present and coming seasons. The sizes of these silvered-

back, plate-glass mirrors (some with ground edges and Bakelite backs) vary according to the design and size of the vanity, dresser or chest with which the mirror is to be used. One fine Modern vanity had a circular mirror 56-in. in diameter and ⅛-in. thick, with a Bakelite back. Another Modern bedroom suite showed a 42-in. mirror on the vanity.

Living Room and Novelty

After a glance into the spaces showing living room pieces, it is evident that the finisher did not have much of an opportunity to show his art. Sofas, both sectional and in the stationary davenport type, together with chairs of the cocktail, easy, and occasional types, did not reveal much woodwork either at the top or bottom rails, or on the fronts or supports of arms. Nearly all of these pieces were covered all over with upholstering materials, mostly in pastel colors.

Modern sofa-side radio and end-table cabinets (which pieces are also customarily placed beside a cocktail chair), together with walnut cocktail tables of the Georgian Period, were shown. In the Chinese Chippendale style, fret-work was seen, together with pierced grills on legs and aprons of tables, and on the ends of bookcases. All of these novelty pieces were in solid American black walnut, excepting the grills on bookcases, which were of 3-ply walnut panel stock. All of the Modern Georgian and Chinese Chippendale pieces were finished in lacquer, bringing out the natural color of the walnut wood.

Breakfast Room and Kitchen

One of the illustrations accompanying this article shows a birch

Dressing table of a Doric suite. Colors: Old white with chocolate brown at top and bottom. Finish: Lacquer enamel, rubbed. Photo, courtesy Kittinger Co., Buffalo, N. Y.

dinette extension table in an excellent Modern design . . . . from a suite having birch chairs with "wind-blown" back splats, upholstered in an old rose or antique white leatherette material. This Modern birch set had remarkable dealer appeal. It is finished in lacquer and dull-rubbed until the result is a delicate tone of the natural birch wood; an optional finish duplicates, as nearly as possible on birch, the lovely brown color of American black walnut.

Manufacturers of breakfast suites and kitchen cabinets are still adhering to the regular substantial and ordinary styles and finishes—what you might term "commercial types." These include regular solid oak breakfast and dinette suites having pearl white, bone ivory, oyster white (the latter with reddish brown filler) and weathered oak (lighter than gold-

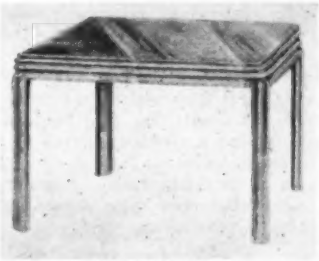
en oak) finishes . . . . decorated with the usual stencil around the edges of table tops and on chair seats and back rails. Nearly every breakfast and dinette manufacturer showed one or more sets in solid rock maple, depicting a famous reproduction of old New England . . . with pegged and edge-worn table tops and chair seats. These maple pieces were finished in an alcohol resistant lacquer thoroughly tested to stand severe use . . . rubbed with pumice stone and oil to a smooth satiny surface, in a beautiful, honey maple color.

Kitchen cabinet manufacturers are endeavoring to match the finishes on their substantial and ordinary oak numbers with the solid oak sets manufactured by breakfast and dinette furniture manufacturers. They are still maintaining the usual synthetic enamel finishes on their regular gum cabinet cases. Prevailing colors are white, gray, green, and ivory, with combinations of the two latter solid colors being most desired by the trade at this writing. Manufacturers of chifforobes and dresserobes are eliminating the heretofore oak finish on gum cases, replacing it with maple finish which is almost as dark as a honey-colored maple.

Beach, Porch, and Lawn

Modern arm chairs and gliders having metal frames finished in white enamel (also chromium plated) were upholstered in colorful duck materials; also in a blue or yellow leather-like fabric. Metal cane backs and seats, in a yellow or green enamel, were popular on metal chair frames having either a white enamel or chromium finish.

Rattan outdoor pieces were shown in lustrous blue, white, and green enamel finishes. Upholstering for the chairs and seats was either in a Charteuse leather woven material or in a leather-like fabric of canary yellow.



A modern birch dinette table designed by Lester Wuenn . . . from a popular suite having chairs with "wind-blown" back splats, upholstered in old rose or antique white leatherette. Finish: Natural birch or imitation walnut.

Cocktail and umbrella tables predominated in round gum-wood tops, which were about 30-in. in diameter . . . finished in white or blue enamel. These tables have a pedestal support made of the same wood as the tops, finished in a different color than the tops.

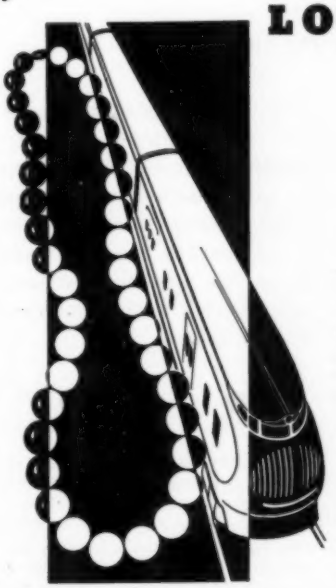
Safety "Point of Danger" Signs

Standard and special danger signs in bright colors are illustrated and identified by reference number in a new 4-color folder being distributed by the Mine Safety Appliance Co., Thomas and Braddock Aves., Pittsburgh, Pa. These signs are finished in porcelain enamel on 18-gauge metal; standard sizes range from 7x10-in. to 10x24-in.

FORMULA FOR SNAPPING UP PIGMENTED LACQUERS

If you wish to secure a Metallic looking finish with an ordinary colored Lacquer, add from two to eight ounces of Puritan Bright Silver Paste No. 200 to your color. This Puritan Paste must, however, be first reduced to a liquid consistency with a Good Grade of Thinner. Samples sent on request with technical information. Otto A. Both Corp., 50 Hartford St., Boston, Massachusetts.—Adv.

Pearls OR LOCOMOTIVES



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Aircraft Insignia—II

On Commercial and U. S. Military Airplanes

by George A. Endom

This article begins with the subject "Army Airplane Marking—identification colors and markings for pipe lines and wiring," and includes frame marking, finish codes, fuselage marking, model designation, serial numbers, lower wing lettering, strut numbers and the star insignia.

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TO ENABLE the reader to comprehensively absorb that which follows, I shall have to take the different phases of marking in the approximate order of application, and not in the order of their importance. While each item is important from the standpoint of technical accuracy, it can readily be understood that the larger and more prominent items must be not only accurate as to size, location and color, but also they must present a pleasing appearance of neatness and artistic workmanship.

Part numbers of fittings and assemblies are stamped before final finish; nameplates are of metal, stamped and etched before attaching. These are seldom of any concern to the finisher. . . .

All pipe lines are marked with an identifying color, with a 1-in. band of that color about 1-in. from each side of every joint, union, or flexible connection. Also, where a line has considerable length, it is sometimes advisable to place an extra band at intervals along that line. This enables the mechanic or

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repair man to readily identify that particular line.

Identifying Colors

The colors used for the various lines are: for fuel, bright red; oil, chrome yellow; fire extinguishers and lines, blue; water, white; Prestone (three bands) white, black, white. Tank filler caps are usually painted black with a red center for fuel and a yellow center for oil. Capacity of tank is lettered in the same color as the center of cap. Also, where the engine is not cooled by air or water it is necessary to mark, adjacent to the radiator filler neck, the cooling liquid required. This should be in letters not less than 2½-in. high, in black on a white ground.

Electrical wiring and connections are usually marked by the tracer lines in the insulation and the wiring diagram set inside the airplane, but where a wing, tail part or other surface cannot be removed without disconnecting the wiring, it is important that instructions be stenciled on that part immediately adjacent to where such disconnection must be made. In ½-in. letters, stencil: "Caution. Disconnect electrical wiring before removing wings." (Or whatever the part is named).

Frame Marking; Finish Code

Every assembled frame should be legibly marked, on the rear of the front spar, with the part number and date of manufacture. Where there is only one spar, this is marked; or if the leading edge forms the main member, the information is placed thereon. The size and application of this marking varies with the type of airplane and the senior Air Corps Inspector's desire. I have seen it vary from ⅛-in. rubber-stamped letters to 1-in. black stenciling.

The finish code is important; it not only designates the materials used, the manufacturer who applied them, and the date of application to the Air Corps, but also enables the manufacturer to check the durability of his finishing scheme. At one time it was necessary to code the fabric used, such as: C1 or L1, showing that grade "A" cotton or linen was used. Now, only one kind, grade "A" cotton, is used in fabric covering on all military airplanes.

The coding of finished surfaces now contains: The manufacturer's or depot's call letters (assigned by the War Department in special bulletin); two dashes (--); the code numbers of clear dope or, on metal, the code number of the primer, followed by the letter "D" for dope, or "P" for primer; a number indicating the number of coats applied; again two dashes; the code number of pigmented dope or semi-pigmented dope on the fabric or, on metal, the code number of the protective enamel, followed by the letters "PD" or "SPD" or "E," and the number of pigmented coats applied; again two dashes; the date (month, day and year), separated by dashes, when these protective coatings were applied. Three dashes (---) separate this from the following: The letters "MFG" followed by two dashes, and then the date again, which last must be the same as the date, marked inside the cover on the frame.

An example of the foregoing would read like this: "VV--10D4--107PD2--10-2-31---MFG--9-22-31," and it would mean that manufacturer "VV" applied four coats of clear nitrate

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dope, code No. 10, and two coats of pigmented nitrate dope, code No. 107, October 2, 1931, on a frame manufactured September 22, 1931. Or, if coded: "VV - - 1000P1 - - 2000E2 - - 10-2-31 - - - MFG - - 8-5-31," would mean the same manufacturer applied one coat of primer and two coats of enamel to that part on that date.

These codes are stenciled in ½-in. letters and arabic numerals on the under surfaces of all those parts above the pilot's head (upper wings, ailerons, center-section, etc.). They are placed along the trailing edge with the tops of the letters facing toward the rear. This makes them easily readable from the cockpit or the ground. On the lower wings, ailerons, elevators, etc., the code marking is applied to the upper surface, with the letters facing the front of the airplane. These are also placed along the trailing edge about midway between the two ends.

The code marking is usually applied to the right side of the fuselage along the lower longeron; on the vertical stabilizer or fin, on the right side, tangent with the edge close to the fuselage; and, on the rudder, on the right side, close to the hinge posts, with tops of letters facing forward.

Although it is not mentioned in any Army specification I have seen, it is usually required that following immediately after each finish code line, there be applied a white box approximately 1½-in. by 2¼-in. for the inspector's stamp and date of acceptance. This can be painted in white dope or flake white, or a masking patch can be put over the clear dope and removed after pigment spraying.

Fuselage Marking; Model Designation and Serial Number

On the left side of the fuselage, forward of the front cockpit, or (where the cockpit is in the nose of the fuselage) immediately to the rear, the following information is lettered:

U. S. ARMY—XLB-2
(or whatever the model designation)
AIR CORPS SERIAL NO.
(Insert Number)
Crew Weight Lbs.
(Left Blank)
Fuel
Main Gal. Lbs.
(Insert Information)
Reserve Gal. Lbs.
(Insert Information)
Auxiliary Gal. Lbs.
(Insert Information)
Oil
Main Gal. Lbs.
(Insert Information)
Auxiliary Gal. Lbs.
(Insert Information)
Cargo Lbs.
(On Transports only)
Gross Weight Lbs.
(Insert Information)
See card in pilot's cockpit for "Detailed Weight Data, Rigging Diagram, Fuel System Diagram."

The first two lines of the above are in 1-in. letters; the balance is ½-in. lettering with arabic numerals for weights and gallons.

Usually a machine-cut stencil is used with drop black or flake white in japan, applied with a stencil brush. After the lettering is finished, a coat of varnish is advisable to bring the lettering into relief from the mat finish to which it is applied.

Other marking applied is special information and, near the tail-end, the word "Lift" is stenciled at points where the hand holds or lift points are situated.

Lower Wing Lettering Strut Numbers

The bottoms of the lower wings receive the lettering "U.S." on the right wing and "ARMY" on

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Underside of lower wing, where right wing is at right, and left wing is at left in illustration. "A" is chord length, "h,h," hand holds in black; "f,f," finish code lettering, top side only; "s,s," strut numbers, top side only. The lettering "U.S.Army" is in black. The insignia consists of a white, 5-point star with a red disc inside and a blue field outside.

the left wing. The tops of the letters are always toward the leading edge, the size is 24-in. high, and approximately 16-in. wide (using the letter N for an average) with a 4-in. stroke.

This lettering should be centrally located between the inboard end and the star insignia, and between the front and rear spars. Modified block letters are required. On a monoplane this lettering would be on the lower side of the single wing.

Strut numbers vary with the different types, but there is one rule that can, and must always be observed: a) *All front struts receive odd numbers;* b) *All rear struts receive even numbers;* c) *Numbers always start with the right front outermost strut as number one, and the right rear outermost strut as number two.* Diagonals between front and rear struts are not usually numbered.

The numbers are ½-in. arabic, placed 1-in. from the lower end of the strut, and a corresponding number is placed on the lower wing or fuselage close to the fitting where strut is attached.

For example, as the pilot is seated in the airplane, struts No. 1 and 3 would be to the right and in front of him, while struts No. 2 and 4 would be located to the right and in back. On the left wing the numbers would continue: 5 and 7 in front, and 6 and 8 to the rear. On triplanes the numbering continues in consecutive order after the lower group is numbered.

The Star Insignia

Briefly as possible and avoiding too many technical terms, I shall first give the basic points to remember in the size, location and color of this insignia.

The size is always ¾ of the available chord. For example, if a wing has a chord length of 60-in. the full size of the star would be 45-in. If, however, 15-in. of the whole wing chord is taken up by the aileron, the available chord length would be only 45-in., making the size of the insignia 33¾-in. The size of the star must never exceed 60-in.

The location on wings not having a tapered end is ⅓ of the whole span in from the tip. On wings having a sharp taper this dimension is ⅙ of the span. Thus an airplane with a wing span of 64-ft. would have the center of the insignia 4-ft. inboard from the tip and on a tapered wing of the same span, the location would be 8-ft. If, however, this calculation brings the outside edge of the circle less than 6-in. from the

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tip, the star is moved in sufficiently to allow this minimum.

The fore and aft location is central with the whole wing chord, except on wings having ailerons, when the outer edge is supposed to be tangent with the aileron cut-out. Usually the inspector will allow the insignia to be moved forward an inch or two to facilitate the application of the star without distortion. One point of the star must always be toward the leading edge.

The colors and design are the same for all aircraft. A red circle inside a white, 5-pointed star, inside a blue circumscribed circle. The red and blue must conform to a specification shade (usually the same colors as used in our flag).

(Part III will follow in a later issue)

Automotive Finish Schedule

THE 1935 production schedule of cleaning, finishing, sanding and drying operations, as it applies to automobile bodies manufactured in a large, modernly-equipped automobile body plant, includes the following:

1) Give surface a preliminary cleaning with gasoline.

2) Clean thoroughly by brushing on a cleaning solution made by mixing a commercial cleaner* 50/50 with water.

3) Hot water rinse.

4) Blow off with compressed air, and lightly wirebrush.

5) Wipe clean with alcohol.

6) Spray on one coat of combination red primer-surfacer.

7) Air dry for three minutes.

8) Spray on second coat of combination red primer-surfacer.

9) Bake at 250°F. for 110 minutes.

10) Sand wet with No. 320 sandpaper.

11) Spot in with primer.

12) Place body in a clean, conditioned room and tackrag the entire surface to clean it thoroughly.

13) Spray on one coat of synthetic enamel.

14) Air dry five minutes.

15) Spray on second coat of synthetic enamel.

16) Bake at 225°F. for 60 minutes.

17) Allow body to cool off 15 minutes.

18) Inspect the final job carefully.

REPAIRS — Damaged places requiring refinishing are wet sanded with No. 320 sandpaper, spot primed with suitable primer, and run through the enameling system again. This synthetic finish cannot be spotted in like a lacquer job, therefore entire panels are refinished. In the case of bad orange peel appearance, the entire body is wet sanded with No. 320 sandpaper; then resprayed and baked.

*Name will be given on request.

New Ross Metal Decorating Oven Bulletin

The growing demand for coated and decorated metal sheets for the manufacture of packages, cans, caps, crowns, toys, signs and other products has necessitated the development of new finishes with finer production demands as well as modern, better equipment. Positive, automatic temperature control, safety, economy, precision in production are major advantages being secured with the new Metal Decorating Oven designed and constructed by the J. O. Ross Engineering Corp., 350 Madison Ave., New York, N. Y. An attractive booklet has just been prepared which fully describes and illustrates the new Metal Decorating Oven.

What to Consider when Testing or Selecting

Wood Fillers

by P. H. Faucett
Research Chemist

A GOOD WOOD FILLER, like most other good products, is a compromise between its various desirable and undesirable properties. The easiest working wood filler may not be the best sealer to prevent soaking away of valuable lacquers or varnishes used as surface coaters. A filler may rank high in workability and sealing properties, and yet bleed badly; or it may be excellent in these three and fail to dry quickly enough for modern schedules. A filler may be expensive per pound and yet be the most economical when all factors are considered and weighed.

To properly judge a filler we ought to require, if possible, that it possess:

1. A toleration for cheap thinners such as gasoline or distillate.

2. Non-settling pigment before and when thinned.

3. The quality of rubbing off easily when thinner has evaporated.

4. The property of rubbing off without pulling out of cracks, holes, etc.

5. Rapid oxidation or drying speed.

6. Non-gummy surface when sanded subsequent to oxidation or drying.

7. High sealing action.

8. A non-wrinkling surface, when dry, as a base for lacquers or modern varnishes.

9. A non-bleeding surface.

10. A smooth surface.

11. Adhesiveness when dry or oxidized to under surface and top coat.

12. No such substances as neutral oil or heavy distillates.

13. Low cost.

Both the formulator and the buyer would do well to make tests with a set of definite points in mind. If you compare two products in a hurried way, you may be impressed by some one or more qualities of one product without noticing its many bad features. Carrying all the fillers through the various steps involved in practice simultaneously, is the most impressive way to discover real merit.

1. Thinning the wood filler, as is usually done by wood finishers, to the consistency of thick cream, will reveal whether or not the vehicle or liquid portion of the filler is compatible with distillate or gasoline. A smooth, oily-feeling mixture will show that it is compatible. The production of more or less stickiness, or a tendency to settle out like cottage cheese, shows extreme incompati-

bility—caused probably by the use of heat-bodied oils or some bakelite resin and oil mixtures. Large percentages of cheap resinates might also cause this phenomenon.

Someone might suggest the use of such aromatic compounds as xylol or toluol or naphtha, but these have a tendency to penetrate wood and carry the oil with them, leaving the porous pigment at the surface where it merely aids absorption of an excess quantity of lacquer, and where it may act as a dulling agent. The petroleum solvents have less tendency to penetrate porous wood. The raw or slightly boiled oils are commonly used because of their petroleum thinner solubility and low viscosity.

2. A very undesirable feature of some fillers is their tendency to settle out in the original container, leaving liquid on top, and a hard caked paste on the bottom. This may be due to the presence of too much oil or other vehicle, or the use of too course pigments; to the absence of "suspension" agents such as asbestine, or one of the metallic stearates, or a finely divided wax. It is, however, possible to have useful surface liquid where some volatile solvent is added by the manufacturer to develop some quality such as quick initial evaporation after smearing or spraying on wood. The non-settling qualities of thinned fillers are best observed in tall bottles or graduated cylinders, where the amount, quality and type of settling can be seen.

3. The "rubbing off" of excess filler is usually accomplished by hand rubbing with rags, burlap, excelsior, sea grass or some material especially made for the purpose—rubbing across the grain of the wood, and doing the work in from five to thirty minutes after the filler has been applied. It is necessary that one make these tests on similar pieces of wood, and at the same time gauge the ease of working. Excess oil or the presence of highly bodied oils will tend to increase the work of rubbing. The use of about 5% calcium or zinc stearate with the usual flinty silica tends to reduce the energy required.

4. Oak, with its deeply furrowed grain, is excellent for testing the ability of filler to cling to cracks and holes when rubbing across the grain. Very similar pieces must be used for comparison. It is obvious that filler will pull out of wide furrows easier than narrow deep ones.

5. The rate of drying or oxidation and "set-up" after the "rub off" can be tested very nicely by spraying stripes through a stencil onto the various pieces of filled wood to be compared at intervals of one hour—or less in the case of special quick-drying fillers. The new 4-hour-drying linseed oil might be used in fillers for speed. The extent of absorption and loss of gloss will indicate the relative drying speed.

6. When sanding is necessary before application of the first coat of finishing material, the filler should not present a gummy surface, which rapidly fills up sandpaper. This factor may be controlled by the use of quick-drying oils, but more especially by the use of pigments such as talc, the metallic stearates, etc., along with the commonly used flinty silica.

7. The sealing action of fillers should be tested as suggested in

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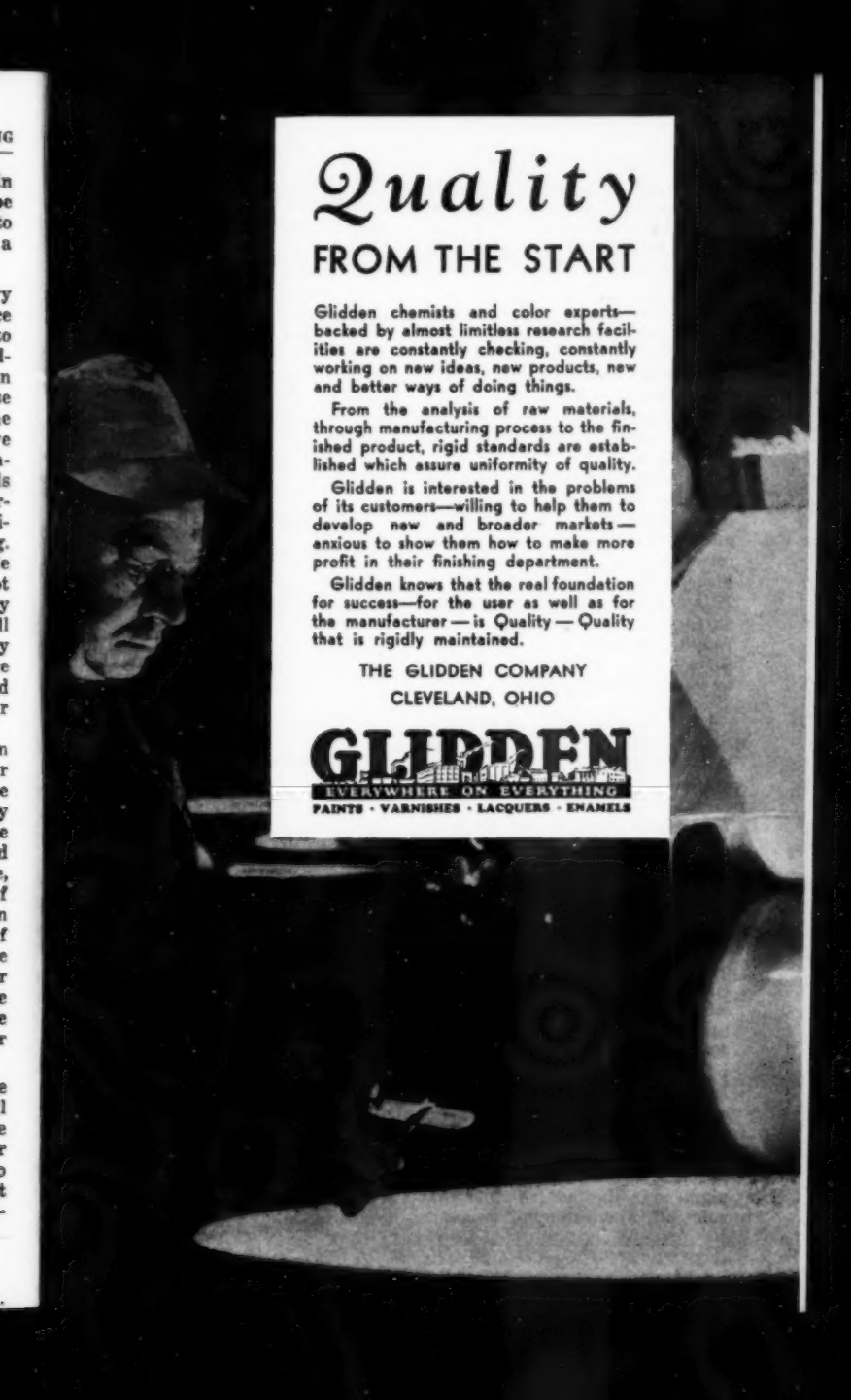
paragraph 5, with finish chosen to follow it. The tests should be made on the same piece of wood and at the same time. If they are tested at different times of the day, the temperature and humidity in ordinary rooms will change enough to throw the results completely off. A filler with too much oil will have a tendency to wrinkle, and one with too little oil will allow the surface coat to soak away until the pigment particles protrude beyond its surface. There should be just enough oil to fill the spaces between the particles of pigment, and then the areas that do wrinkle will be so small and so hedged about with restraining solid objects or particles that the surface will be practically smooth, even though it may be filled with strains and stresses. The size of the pigment is important. If too large, the filler will flat the lacquer over it because the oil vehicle does not rise by capillary action above it, and because larger cavities between particles allow absorption of more lacquer into the wood, thus presenting a relatively porous surface to the sanding sealer or first coat. The proper size and grading of the pigments can be observed very nicely under a microscope.

8: A filler's resistance to wrinkling will depend upon the proper ratio of pigment and oil or vehicle, as well as upon the type of vehicle—whether it be oil, resin, varnish, or a mixture of them. Unsaturated oils and resins will have a greater tendency to wrinkle than those that are saturated. This quality may be tested by spraying one stroke of lacquer across the various prepared filler samples on wood. The late bakelite type varnishes will contain solvents of the aromatic type which may have a tendency to wrinkle filler—although it is a poor filler which does it.

9: A non-bleeding filler is very important, because it will reduce the number of coats necessary to produce a beautiful finish. Bleeding of filler pigments may flatten or roughen a finish or, in the case of colored finishes, it may fog the beautiful grain effect and give the appearance of careless finishing. The percentage of materials that are soluble in lacquer or varnish should be reduced to a minimum in order to avoid bleeding. Of course, pigments are insoluble and the finer pigments will not only give a greater percentage by volume of insolubles, but they will set up more powerful capillary and adhesive forces than the large particles—all of which will tend to fasten the particles in their respective places.

Gums that tend to dissolve in solvents and thinners for lacquer or varnish are liable to increase trouble of this kind. Very highly bodied oils will require volatile solvents which pass away and may leave a honey-comb structure, or one which readily pulls out of shape so as to allow penetration of solvents. Colored pigments, of course, should be free from soluble dyes that are famous for their bleeding qualities, especially the oil-soluble dyes. Alcohol-soluble dyes are better and the water dyes are best.

10. The smoothness of the surface presented by fillers will be determined by the proper size of pigment; by the use of oils or vehicles that do not shrink into the grain of the wood, which might indicate a cheap false-bodied prod-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uct; by the proper ratio of oils and pigments. A sticky filler will also have a tendency to pull out of the deep pores and produce a rough surface.

11. One of the important factors in producing a filler that will adhere to wood, and to the surface coater above, is that of pigment shape. The flinty, sharp-edged pigments are good in this respect. Here again the use of too much oil or vehicle will "drown" the pigment, so that the pigments do not touch the rough places on the wood sufficiently, and so that the pigments do not interlace and bind one another in place as they would with less oil. It is also important that the filled surface be either microscopically rough, or sufficiently soluble to form a bond between the lacquer or varnish and the filler.

12. Neutral oils and petroleum distillates of low volatility are very apt to cause trouble by destroying the adhesiveness of the surface coater, or by causing them (especially lacquers) to blush or turn white or dull.

13. The cost per pound of a wood filler means very little, because it is not weight one is buying, but service and volume or quantity filling and sealing material. I know one manufacturer who used one-third barytes and two-thirds silica so he could get 100-lbs. of filler in a certain size pail. By so doing he not only made the filler awkward to handle on account of its quick-settling properties; but he deprived the customer of about 17% of actual filling material on every pound of pigment in the pail. A filler that rubs off, for example, twice as easy as another one might cost twice as much, but the few cents saved on filler would be eaten up several times in wages, even at their present low level. Then a cheap filler may allow twice as much lacquer to soak through before a good finish is produced, and thereby more than cancel the saving of say even five cents a pound on filler. Therefore all the foregoing points should be carefully considered before making a large purchase of filler.

Alcohol-Resistant Clear over Metallic Enamel

H. V. Walker Co., Elizabeth, N. J., announce that the metallic enamels in their "32000 Line" can be coated with a clear, alcohol-resistant lacquer to make them impervious to alcoholic beverages and fruit juices. These non-fading enamels are available in popular silver, gold, bronze, brass, copper and gun metal colors, and in old rose, blue, green, gray, and black.

Radiator Cleaner

The Finishes Division of the Du Pont Co. has added to its No. 7 line of Chemical Specialties a new Du Pont radiator cleaner that exhaustive tests show will not rust or otherwise damage aluminum or aluminum alloy or other metal parts in auto motors or radiators. Many of the more modern motors use aluminum as a part of their cooling system. Tests also show that permanent spots will not develop on Duco, Dulux, baked enamel or chromium if this cleaner drops on them.

Metal Cleaning Book

An illustrated book from the press of E. F. Houghton & Co., Philadelphia, Pa., contains 44 pages, 6x9-in., in which there is a variety of valuable information about cleaning various kinds of metals and metal products preparatory to the application of finish coatings. Practical information is also given about cleaning various kinds of service and production equipment in different industries. Copies of the book will be sent free to production executives.

Finishing Philippine Woods

Since my article on the finishing of Philippine mahogany was published in June issue (pages 34, 36) some questions have come up from readers which I will try to clear up here.

Referring specifically to the published letter from L. D. Co. in July issue (pages 54, 55) as to whether or not lauaan is the same wood as Philippine mahogany, one of the biggest importers of this lumber here (Los Angeles, Calif.) informs me that all so called Philippine mahogany is of the lauaan family — only some lumber concerns use a trade name of their own. There are several species, however, and the best of these is the light red and dark red. This concern also informs me that the spongy part of the log should never be used for building furniture, fixtures, or interior trim.

Regarding the name "Philippine mahogany," I understand that some ten years ago this matter was before the Federal Trade Commission and a ruling was issued that the Philippine woods were not mahogany. This was in effect for several years and confirmed by the lower courts, and in effect by the Supreme Court which refused to review the case under writ of certiorari. Later the Federal Trade Commission reopened the case to hear alleged new evidence and . . . it was ruled that the word "mahogany" could be used if always used with the name "Philippine."

There is pending before the Federal Trade Commission a petition by the Mahogany Association, the Hardwood Institute, the American Walnut Manufacturers Association, and supported by the National Better Business Bureau, to forbid the application of the name "mahogany" to such woods as tanguile, red lauaan, white lauaan, almon, etc., originating in the Philippine Islands and sometimes called "Philippine mahogany."

Now as to the finishing of Philippine woods, some of this spongy wood soaks up finish as fast as it can be applied. This is the reason I recommend filling first, then staining with permanent stain. If this costs too much, use a pigment oil stain.

Nearly always the spongy or soft Philippine wood has a very light color, and can easily be identified, as it carries very little ribbon grain. Some of the darker and harder woods finish up like most of the hardwoods.

I've come now to the question of applying permanent stains to hardwoods like maple, birch, etc. I believe there are no finer stains for these woods. However, they must not be applied in a haphazard way. They work similar to a water stain, but if too much air pressure is used they dry immediately and, naturally, cannot be controlled. The spray operator can control these stains easily if he cuts them down in strength to a lighter shade than the shade desired. The soft parts of the wood will then be light on the first stroke of the spray, and when the

Questions « Answers

particular piece he is working on has had an application of the stain all over, he can go back and touch up the light spots—or in other words, the harder woods. The spray operator can do this very quickly once he gets used to the stains. It will take a little practice, but once he gets the hang of it he can do a beautiful job; and, in most cases, it will not require a shading stain afterwards.

In applying these stains, the operator can easily verify my statements by making the following test: Spray some stain at say 90-lbs. pressure; he will notice that the stain will not go into the corners or carvings; if he tries to get it into the corners, the place all around the corners will become too dark. But if the pressure is cut down to say 40-lbs., and if the stain is cut down some with thinner, there will be no trouble of this kind.

Here on the Coast, manufacturers of the cheapest furniture use this stain on some of their suites because it is cheaper in the long run and it saves wash coats, sanding, and shading in a lot of instances.—ORRIE D. MAAL.

Metal Cleaning

Recently we have been manufacturing quite a quantity of plain flat panels made of No. 22 gauge auto body stock, the average size of which is 30x50-in. The majority of these panels are finished with two coats of high-bake black japan, but quite a number are finished with three coats of high-bake white Dulux.

We are interested in discovering a better method of cleaning the metal for the enameling operations. Since the auto body steel comes to us well oiled, we have been hanging the panels in the oven and baking them at 500°F. to oxidize or burn off the oil.

The panels are then sanded with No. 7/0 sandpaper to loosen any sooty deposits, and then rinsed with solvent naphtha. Just before spraying or flo-coating, the panels are dusted with a brush.

Although we have had fair success by using this method, we are interested in obtaining a more efficient system, and one that will be even more positive in results.—T. H. B. Co. (Pressed Steel Products).

Where you mention that, "just before spraying or flo-coating the panels are dusted with a brush," we suggest you use a tack rag for this final cleaning. Excellent tack rags are made especially for this purpose or your own finisher can prepare them.—W. H. R.

We have a similar condition within our own plant, and our method has been very satisfactory and highly recommended by a nationally known finish manufacturing company who have tested out our panels repeatedly with satisfactory results. It is as follows:

Wash in naphtha to remove oil. Stack on drain board and allow to drain thoroughly until almost dry. Place on open slatted table and wash with a chemical cleaner (names on request). This material will complete the removal of oil, will etch the sheet and remove the soluble salts of the steel itself and neutralize the alkalies, which are so detrimental to paint. This same cleaner will also remove light rust, which is especially important as so much of the rust may be invisible to the eye.

VALUE *above* COST!

NOT by magic, but by using accepted standards as your "yard stick," you will find it possible to produce a *better* finish at no additional cost, with our "Unquestionable Quality"—Custom-Built finishes.

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Wood Finishing Supplies

1830-32 North Laramie Avenue **Chicago, Illinois**

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Filwhirl Enameler

For Coating Small Parts

CAN you overlook an opportunity to coat products by the thousand at the price of dipping a dozen? This is the question put by a user of a Barrett Filwhirl Enameler to another manufacturer who inquired of him about this machine; and it is very often a fact.

It pays to investigate new methods that have been recently introduced. Progress has been made.

Send samples of your product to be enameled and returned for your inspection with our report, estimates, etc.

The Leon J. Barrett Co.
Grafton Street, Worcester, Mass.

Kindly mention INDUSTRIAL FINISHING when writing advertisers

The applying of this material on the steel is done with a soft, round, long-haired brush.

The next operation is to wipe the surface dry with clean rags. As the rags get dirty, they can be rewashed for approximately 3¼c to 4c per pound, and used over again. We find it pays to use a durable absorbent rag that will stand repeated washings.

After the steel has been thoroughly dried, we dust off with a brush only if very dusty, as otherwise a tack rag is much more efficient and exceedingly more effective.—M. M. MILLER.

What Causes Pitting

To answer C.W.C. in July issue, page 4, on "What Causes Pitting?" when pitting occurs in a black, take some fresh material from the original package, flow it out full body on a piece of clean glass, and also reduced with clean thinner to the consistency at which the black is used; bake in the usual manner. If pitting occurs in the unreduced goods you know the trouble is in the black.

If pitting occurs in reduced goods it may be due to your thinner. Select some other thinner, and if pitting still occurs, it is most likely due to your black.

Sometimes pitting of a black can be overcome by heating to 180° to 200° F. for an hour. If the black, either full body or reduced, does not pit on glass, you know the trouble is somewhere on your surface. It may be moisture or alkalies, either from a contaminated dip tank or moisture from the air line. It may be due to alkalies from improper cleaning left dry on the surface.

If heating does not overcome the pitting of the black, go back to the people from whom you purchased your black.—CARL J. SCHUMANN, Pres., Hilo Varnish Corp.

Their are various causes for pitting, such as open pores in the surfaces being finished (castings where filler is being used) .... cause pits by expansion and contraction.

Water is mostly the cause, the air being full of water in sultry weather. The article that is being coated has inhaled enough moisture and, being insulated by coating, when heated will expand causing the moisture to blow out, leaving a pit. Again, when the moisture is in the material and after it is being applied .... when heated the water will concentrate and separate from the material into very small particles, not visible to the naked eye; this will form steam and explode, leaving a pit.

How we get the water is to be traced by the one in trouble. I have found it be 1) the air intake, 2) the air filter, 3) material in metal drums, 4) so-called wetting of iron pipes. There are only two things to cause pitting—air and water.—LOUIS F. GEILS, King Japanning & Enameling Works.

Synthetic Finish in "Normandie"

The growing importance of chemical and synthetic products in certain phases of decoration is interestingly shown in the work done on the new French Steamship, "Normandie." Reports from Paris state that a new finishing material developed on a synthetic base by a nationally-advertised company in the United States, has been used for the painting of bathrooms and lavatories. The Paris report also states that Fabrikoid has been used to upholster the furniture in the officers' quarters and for chairs in other parts of the ship.

Yesterday—

"Wood Lacquers"

TODAY—

3697 SUPER WOOD FINISH

A GRAND PIANO is not comparable with a midget radio. Neither is 3697 with "wood lacquers" of the usual type, made to sell at minimum prices. If the best is none too good for your product, remember 3697 only costs a trifle more. This trifle, however, permits us to use ingredients of surpassing qualities.

3697 has optimum resistance to graying, checking, cracking and scaling. It dries rapidly, recoats rapidly, but hangs on grimly to the wood.

At its best, wood is a treacherous surface for finish. We expect 3697 to be used on the best wood, carefully prepared. Try humidity and temperature-change tests on it. Test it for toughness. Notice the enduring brilliance of the finish.

For the most critical—3697.

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5208 HARVARD AVENUE, CLEVELAND, OHIO

BETTER FINISHES at BIG SAVINGS

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F707
Superior
Airrubbing
Machine

Showing two pad assembly

CUT your rubbing, polishing and sanding costs: spare your employees that fatiguing labor; secure finer finishes—with Paasche Airrubbing and Airsanding Machines. Easy to handle, well balanced, free from vibration, give years of uninterrupted service without breakdowns or repairs. For pumice slush, felt or sandpaper. Used by leading industrial manufacturers everywhere. Write for technical bulletin giving full details of savings possible with Paasche Airequipment.

Paasche Airbrush Co. 1917 DIVERSEY PARKWAY CHICAGO, ILL.

What's New « «

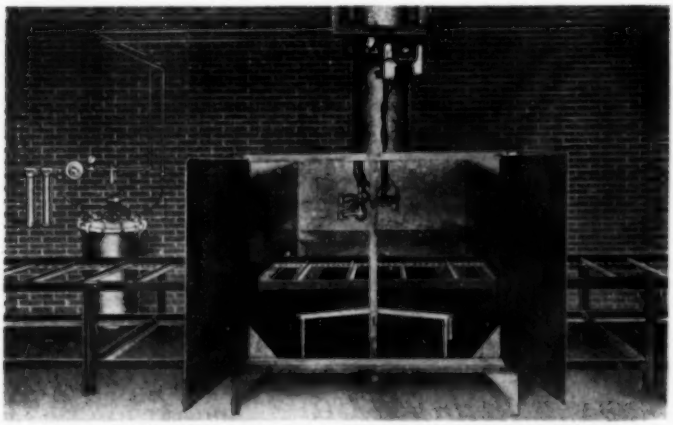
Swinging-Arm Spray Coating Machine

The De Vilbiss Swinging-Arm spray-coating machine illustrated in this article is designed for production spray coating of flat products up to 4-ft. in width, such as sheet metal, glass, tile, fabrics, floor coverings, wall board, paper, imitation leather, and the like. The machine applies a smooth even finish at a speed of from 10 to 40-ft. per minute, depending upon the type of surface, kind of finish desired, kind of finishing material used, and speed of conveyor.

Supported in a suitable frame, the machine is mounted to the ceiling above the conveyor which carries the work to be sprayed. The mechanism used to drive the two swinging arms, which carry spray guns, is so designed that a slowly increasing and decreasing reciprocating motion is provided to compensate for the arc which would be produced by swinging the arms from a fixed position. The result is a uniform sprayed coating from one side of the work to the other.

Spray guns are automatically opened and closed at the beginning and end of each stroke, just as in proper hand operation. The spraying time of the guns during the stroke can be varied to suit the width of the product to be sprayed.

This spray booth is composed of four sides and a bottom. The conveyor and the work it carries enter and leave the booth through openings on opposite sides. Two large doors at the front permit easy access for cleaning. Bottom of booth is flat. The exhaust duct, at bottom of booth and at right angles to the conveyor, has a removable top and adjustable side openings so set as to create an even distribution of exhaust. Fan connection is made at the back of the booth from which the exhaust pipe may be run in a vertical or horizontal direction. Air is drawn



An unusual adaptation of spray-painting equipment to continuous production. . . . for coating flat sheets of any material. Product of The DeVilbiss Co., Toledo, Ohio.

through the open top in a downward direction—the same direction the guns spray. There is no surface upon which deposits may accumulate, and later drop off onto the finished work.

Standard items of spraying equipment are used—a pressure-feed paint tank of suitable capacity, and the necessary air and fluid piping, valves, regulators, gauges, etc.

The swinging-arm machine and down-draft spray booth are designed, engineered, and built on special order only. Each installation has its own particular requirements; no two can be served with exactly the same equipment.

Magic Tack Rags

The purpose of a tack rag is to pick up dust, lint, sand particles or any foreign accumulation on the surface to be finished. The greatest detriments to a good paint, varnish or enamel job are little particles of accumulated dirt that cannot be entirely removed by a dry cloth, or even by sponging or chamoising a surface. This can only be cleaned with a tack rag made tacky for this purpose.

Magic Tack Rags, made by Wm. A. Juergens Co., 4040 Lagrange St., Toledo, Ohio, are fine cheesecloth, impregnated with chemicals that create the "tack" that picks up dirt, sand particles, and foreign matter from the surface of metal, wood or material to be finished. They retain this "tack" indefinitely, and are spontaneous combustion proof. If you place one in a drawer, you need not worry about it deteriorating or starting a fire.

Paint Spray Filter

Filters for installation in the backs of spray booths, to catch the residue from paint, lacquer or varnish, are offered by the Chicago Paint Filter Co., 5604 W. 63rd St., Chicago, Ill. A typical installation of six units in

How recently have you checked your cleaning methods?

During recent years there has been extensive scientific investigation of detergent or cleaning processes. Methods of industrial cleaning have progressed greatly. Old and obsolete methods have been displaced.

Since our establishment in 1921, we have published more technical data and up-to-date information on metal cleaning operations and methods than all other cleaning manufacturers combined. This is at your disposal.

Write us today. You will receive the latest available information, thus enabling you to check your present methods and take advantage of existing savings where possible.

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M S A Half Masks

Four distinct types available, all with the famous U. S. Navy-Biggs design facepiece. Illustrated here, the new, light-weight M. S. A. PAINT RESPIRATOR HALF-MASK with Replaceable Cartridge . . . . . factory-loaded, affording uniformly low breathing resistance and high protective efficiency . . . renewable in a few seconds . . . assuring complete protection against the gases and fumes met with in paint-spraying, such as Benzol, Amyl Acetate, etc. — as well as fine particles of the pigments.

For complete information and prices on all M.S.A. Half-Masks, write for Bulletin EM-1.

MINE SAFETY APPLIANCES CO.
Braddock, Thomas & Meade Sts.
PITTSBURGH PENNA.

the exhaust chamber of a spray booth is shown in the accompanying drawing. These filters can be installed in any spray booth. They prevent paint or lacquer residues from reaching the exhausting chambers, stacks and exhaust fans. Residue, thus stopped, runs down the filter plates and collects in removable drip pans or drawers.

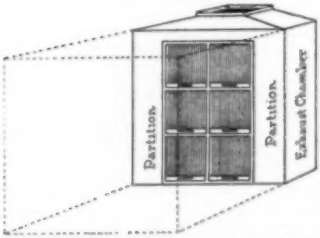

Diagram showing position of six filters (each with a drip pan) in a frame, which is provided with each installation. The frame is centered in the partition which separates the spray booth (in dotted lines) from the exhaust chamber.

Because of their self-cleaning feature, Type A filters can be used over a long period of time before cleaning. They can be easily removed and washed in a stripping tank, after which they are again ready for use. The Type B filter is designed to effect a complete stoppage of the powdery residues from lacquer or similar quick-drying paints; collected residue remains in the filter. The units are easily removed and cleaned by washing in a stripping tank.

According to the manufacturer, a recent installation at the Illinois Central Railroad Shops, in Chicago, is ideal and has been working satisfactorily, with a 100% stoppage of the paint entering the stacks, ducts, and collecting on the fans.

In some installations, where the paint load is very heavy, the filters are cleaned every 8-hour shift; in other installations the filters are kept in service for three weeks. The length of time the filters last depends upon the paint load of the booth, but with the heaviest paint load possible, these filters will run for a full day without cleaning, and will still permit a satisfactory air velocity. Cleaning is simple, as the filters can be removed in a few seconds and placed in the stripping tank to be cleaned; time, 20 to 30 minutes.

Q. D. Synthetic Flat Varnish

The Varnish Research Laboratory of Valentine & Co., 12 Emily St., Cambridge, Mass., recently announced the development of a new, quick-drying, synthetic, flat varnish. The principal objections to ordinary flat varnishes—tenderness and scratching white—have been completely eliminated in this new product which is as economical to use as the regular run of flat varnishes.

Among many of the more recent outstanding industrial product developments of Valentine & Co., this new flat varnish has earned special commendation from several of the larger furniture manufacturers who have

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HORN, JEFFERYS & CO.
916 WEST LAKE STREET BURBANK, CALIF.

heretofore found flat varnishes impractical for their type of high grade work. Several furniture and wood novelty manufacturers have replaced their lacquers with this new flat varnish due to the more economical and better appearance obtained without upset of their production. The varnish dries to handle in ten minutes and may be wrapped the next day without printing.

Battery Lacquers

The Gilbert Spruance Co., Philadelphia, Pa., announces a complete line of finishes for batteries including gloss and flat clear lacquers, gloss and flat black lacquers, veiling lacquers, spatter lacquers and roller-coat enamels. These lacquers will not turn green over sealing compound and are very flexible; will stand outdoor exposure; they dry in from five to ten minutes and are acid resistant.

Liquid and Plastic Rubber for Coating

Liquid and plastic rubber compounds suitable for use as protective coatings—to protect surfaces against corrosion, abrasion, chemicals, damage or noise from impact, etc.—are announced by the Self-Vulcanizing Rubber Co., 605 W. Washington Blvd., Chicago, Ill.

Selfvulc liquid rubber is 90% pure gum. Since it is cold-cured, it will not harden, age, oxidize, crack or blister . . . does not deteriorate with age but retains its resilient rubber qualities indefinitely. It withstands heat up to 200°F., and cold to 120° below zero. Rubber being an insulator, a coat of Selfvulc, .001-in. thick will resist 440 volts.

The liquid rubber can be brushed, sprayed or dipped. Stir well before using. If a brush is used, the liquid rubber should be flowed on and not feathered back and forth. Apply one

Send for the *New* SPRACO Catalog

This new catalog describes in complete detail the latest improved equipment for production finishing operations. Regardless of the equipment which you are now using we believe that it will be to your advantage to investigate the latest SPRACO products.

SPRAY ENGINEERING COMPANY
INDUSTRIAL FINISHING ENGINEERS
116 Central St. Somerville, Mass.

coat of "M" primer and allow to vulcanize for one-half hour. Then apply one coat of liquid rubber Selfvulc and allow this to vulcanize for two or three hours. Follow with repeated applications of liquid rubber Airvulc, allowing one to two hours between applications for vulcanization, until the desired thickness is obtained.

Selfvulc plastic rubber compound may be applied with a trowel, spatula or wide knife. It should be rolled with a wet, round glass or wooden roller, where a smooth surface is desired.

New Process Hardens and Waterproofs Wood

The Pyratone Products Corp., 317 St. Johns Court, Chicago, Ill., has produced a process, wherein a synthetic resin is introduced or impregnated into wood, to improve in a major way several of the characteristics of wood.

In the Temp-Urd Wood process the wood is maintained in a vacuum and then submerged in the liquid resin. Pressure of several atmospheres is then introduced. The impregnated wood is thereupon subjected to a cure at 200°F. for about 100 hours. Absolute uniformity of resin distribution throughout the treated wood is secured.

Golf club heads are treated so as to give maximum hardness, resiliency and resistance to abrasion; baseball bats to give them a high resistance to chipping and splitting. In the construction members for airplanes, Temp-Urd Wood combines to give hardness, abrasion and bending strengths, and resistance to moisture to the already present lightness and flexibility of the natural wood. The impregnation hardens the surface—affording substantial backing and eliminating the operation of filling the pores, or a primer coat. Lacquer or varnish may be applied to the impregnated wood.

For handles, wooden bowls, trays—wherever a high, glossy, durable finish is desired—a second application of the material is made, resulting in a transparent finish which brings out beautifully the natural grain of the wood. This second application remains on the surface because it is actually fused to the previously impregnated pores which terminate at the surface, and a firm body anchorage is secured. A remarkably hard finish is produced. Sanding and polishing operations can be performed without in any way impairing its luster and appearance.

The impregnated wood exhibits moisture resistance . . . does not swell or warp, or in any way become distorted when subjected to moderate

"top quality" paint & varnish thinner
. . . excellent for use in spraying, brushing and dipping.
SUNOCO Spirits
SUN OIL CO.
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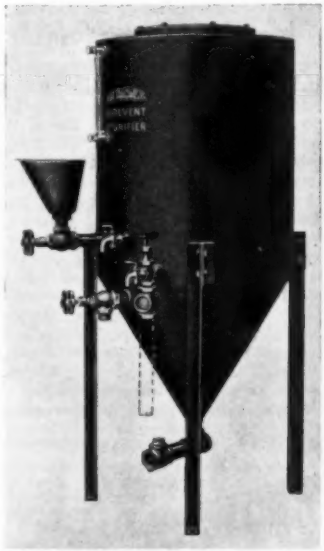
Introducing the
MACLEOD UTILITY SAND BLAST OUTFIT
To fill the need of an inexpensive sandblast, suitable for any kind of work. Includes Gun with finger control, Hose, Collector, Helmet and Gloves. Costs but $36.00. Send for Illustration.
THE MACLEOD CO., Bogen St., Cincinnati, O.

moisture changes. When the second (coating) process is applied, the moisture content is reduced to a negligible quantity.

Solvent Purifier

A solvent purifier for cleaning and purifying solvents that have been used for metal cleaning, etc., is announced by S. F. Bowser & Co., Fort Wayne, Ind. It will completely and efficiently restore the dirty solvent to the same condition as when new. Operation of the unit is simple. A chemical charge, in accordance with the operating instructions, is placed



Cleans used solvents and naphthas safely and economically.

in the purifier. One charge is sufficient to last for one week, under ordinary conditions, and need not be removed or replaced until its strength has been exhausted.

The dirty solvent is then pumped

MARVELOUS NEW PAINT SPRAY GUN

Handles all types paint, lacquer, etc., especially the new synthetic enamels. Lighter in weight, widest spray, perfect atomization; air purifiers, 5 and 10 gallon pressure outfits, accessories, etc.

Write for Catalog.

The Alexander Milburn Company 1402 W. Baltimore St. Baltimore - Maryland

The ideal fan for speeding up drying of parts or articles in process, accelerating ventilation in certain areas, and similar purposes. Motored fan can be tilted to direct draft upward, downward or straight outward on a level . . . Operates from electric light socket and is furnished with vapor-proof or enclosed type motor, as desired. Propellor blade is nickel alloy aluminum. Height 46-in., weight 70-lbs., floor space 38-in. triangular. Price very reasonable.

Send for price, descriptive circular or for any additional information desired

UNIVERSAL MFG. CO.

324 W. 10th St. Indianapolis, Ind.

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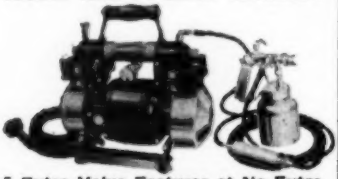
Portable Spray Painting Unit

OPERATES WITHOUT OIL!

MORE AIR . . LESS UPKEEP!



5 Extra-Value Features at No Extra Cost. Advanced engineering allows use of oil-less ball-bearings, guaranteed 25 years. Upkeep costs 50% less. More pressure — more volume, per motor horsepower. Blower-cooled G-E motor. Extremely portable. ¼; 1/3, ½ H.P. Priced from $74.50. Send for full details.

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1218 Venice Blvd. Los Angeles, Calif.

MASKING TAPES

like Permacel, Jonflex and Industrial give you speedier jobs because they stick in any weather. Their precision edges give perfect color separation. They come off clean.

PERMACEL
Paper masking tape with unusual adhesiveness.

JONFLEX
Finely-woven cloth tape extremely flexible and easy to use.

INDUSTRIAL
Heavier, coarser-woven tape for those who prefer this type.

THE REVOLITE CORP.
A Subsidiary of Johnson & Johnson
NEW BRUNSWICK, N. J., U. S. A.

into the purifier . . . and is thoroughly agitated with the chemical charge for the required period. This agitation of the dirty solvent with the chemical charge results in the saponification of the greases, coagulation of the dirt, and collection of any coloring matter. As a result of this action the impurities in their combined and changed form have sufficient weight so that they readily precipitate out of the solvent. Removal of these impurities restores the solvent to its original state of purity and cleanliness, and it can then be returned to a clean storage tank.

Cleans Surfaces, Brushes, Hands, Wiping Rags

A general purpose finisher's cleaner in powder form, for dissolving in hot water, is announced by the Savogran Co., India Wharf, Boston, Mass. It is sold in cans, pails, kegs and barrels for both household and industrial service. Hot water solutions of this cleaner are excellent for cleaning the finisher's soiled hands, overalls, brushes, wiping rags, and in fact any equipment he uses; also this cleaner is effective in various strength solutions for cleaning old painted surfaces to brighten them up, or to prepare them for refinishing. Strong solutions of the cleaner, applied and allowed to stand 15 to 30 minutes, serve as paint or varnish removers. Laboratory tests show that Savogran Heavy Duty Cleaner is an effective germicide and disinfectant.

Finish Stretches Like Rubber

A lacquer coating that rivals the flexibility of live rubber has recently been developed by a New Jersey manufacturer of industrial finishes.

When this lacquer was applied

on a piece of live rubber, the rubber was stretched to the breaking point, but the finish did not chip or brittle off at all, it is asserted.

This stretchable coating comes in a clear and aluminum color and can be applied by dip, brush or spray gun.

Designing Exhaust and Blower Systems

A new illustrated book entitled "Practical Design of Exhaust and Blower Systems," by E. W. Favalora, has just been published by Edwin A. Scott Publishing Co., 45 W. 45th St., New York, N. Y. It is a handbook on the designing and engineering of blower systems, being treated in such a way that the man of limited education can comprehend and understand both its meaning and application. It contains 274 pages divided into 28 chapters, is well printed on good paper, page size slightly under 5¼x8-in., and is substantially and attractively bound in cloth with stiff covers in brown and silver. Price $5.00.

The March of Chemistry

Depicting the progress of chemical industry and dramatizing the part that the "invisible science" plays in every day life, 21 manufacturing divisions of the E. I. du Pont de Nemours & Co. will show their products and indicate the processes by which they are produced at the Eastern States Exposition in Springfield, Mass., from Sept. 15 to 21 inclusive. The exhibit, "The March of Chemistry," will occupy 356 running feet in the Exposition's 3-acre Industrial Arts Building and will be the largest single display ever presented at an annual exhibition. It will be of educational nature and will cover a wide range of chemical products, including several spectacular new developments of du Pont Research laboratories, showing how they are made, how they are used and how they serve, often in an unseen way, the ultimate consumer.

Mixer, Filter, Pump, Tank Catalog by Alsop

A new 32-page catalogue describing the complete line of HY-SPEED liquid handling and processing equipment has just been issued by Alsop Engineering Corp., 39 W. 60th St., New York, N. Y. HY-SPEED filters, mixers, bottle fillers, labeling equipment, bottle washers, glass-lined tanks, asbestos filter discs and filter pulp discs, pumps and revolving tables, in large and small production models, are covered in full in this latest complete issue. Copies of the new catalogue are being sent on request.

For Over 40 Years
Manufacturing Quality
GOLD and SILVER
Colored Bronze Powder
Write for Samples
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Pittsburgh, Pa.

Pyroxylin Lacquers — Synthetic Enamels — Insulating Varnishes—Baking Enamels
IMPERVIOUS PRODUCTS
FOR INDUSTRIAL USE
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FINISHING

Distributed to Executives and Foremen Finishers in industrial plants where finishing coats are applied with finishing equipment

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EDITORIAL

Cleanliness in Finishing Not an Extravagance

Cleanliness is necessary to good finishing—cleanliness of the surfaces about to receive priming, intermediate and finishing coats; cleanliness of the air in the room in which these coats are applied; cleanliness of the equipment, materials and supplies used, including particularly compressed air for spraying; and cleanliness of the workmen's clothes and hands. Whatever reasonable precautions can be taken to maintain this cleanliness throughout the 24 hours of every day is no extravagance.

Probably it is safe to say that the majority of finishing room troubles are traceable to lack of cleanliness somewhere along the line. In the regular course of work, everything seems to be working to defeat the maintenance of cleanliness, therefore constant vigilance is necessary in every finishing department.

New Things in New York

Our New York correspondent reports:

Wrought-iron tables, in coffee table and card table sizes, with chairs to match, for outdoor and porch use, and for inside the home. Table tops are in clear, plated glass, or mirror glass, or fancy tile. Most of them are enameled white; a few are in pastel colors or weathered black.

White enameled wire is formed into plain and fancy borders for mirror-center trays, plates and ivy bowls.

An aluminum lawn mower, 14-lbs. lighter than iron or steel mowers, is popular.

Baby carriages are smartly streamlined like automobiles, and attractively finished.

The prediction is made that natural oak furniture in modern style, dull finished, will be popular. Some of it will have a little color accent or decoration.

Bake-Finishing Ovens

During the past few years the coating and decorating of metal sheets for the manufacture of packages, cans, caps, crowns, toys, signs, and other products has become a major industry. With the growth of this industry, new finishes, new production demands, finer and more exacting work ne-

cessitate modern and better equipment. Formerly, baking ovens that would give a fairly uniform temperature with manual control of a number of burners operating at a low rate of production, were fairly successful; but present demands require automatic control, absolute uniformity of temperature across the sheet, ability to maintain any predetermined temperature curve throughout the length of the oven, elimination of fumes and control of oven atmosphere, the use of the lowest cost fuel available, safety and economy of operation, quick and adequate cooling, all built into a sturdy and compact unit.—*Ross Engineering Booklet.*

Design and Manufacture to Sell

Obviously, the purpose behind the work of designing and manufacturing a product is to sell it—sell it in quantities. No amount of salesmanship or advertising can hope to profitably sell a product that lacks reasonable merit in its design, or finish, or the quality of its manufacture.

Quoting a page from BUSINESS WEEK: "If that first part of the selling job is done intelligently—getting orders is easier, cheaper, quicker. Makers of materials and parts have contributed to many of the merchandising successes of 1935. Through constant research they are continuously developing new and greater sales appeals for makers of finished products. They are thinking ahead—anticipating next year's needs in homes, offices and industry. Your own sales story, in 1936, may be found in the achievements of certain materials and parts manufacturers—who are constantly aware that you must design and manufacture to sell."

Manufacturers of cleaning, finishing and polishing materials, supplies and equipment have developed and are eager to tell you and show you how to profitably use various new things which will make your products more attractive and more serviceable for a longer period of time. Write to INDUSTRIAL FINISHING, and write to the firms whose names appear in the publication. Your letters will be welcome—and they may be the means of increasing your business and profits or savings by a substantial percentage.

Selection of Equipment—Adaptability

With returned confidence and practically certain prospects for continued improvement in business, many concerns are investigating and investing in some new equipment. They realize they must

be better prepared to handle a greater volume of work—much of it on short notice. Quality is being demanded, and in many cases the profit margin is too narrow to permit of much wastage or experimenting through the use of makeshifts or obsolete equipment in production.

An important element entering into the choice of new equipment is the question of its possible adaptability to variety work, versus specialization. Specialized equipment is fine when there is enough work of a certain kind to keep it in useful service, plus the probability that future work of this kind will be plentiful and profitable—until it has paid for itself.

Rapid changes in styles, customer demands, methods of doing work, and improvements in equipment are elements to consider as possibly favoring the selection of equipment that is less specialized, more adaptable to different kinds of work or service, and which in consequence can "earn its keep" every month and every year for a longer period of time than something highly specialized.

On the other hand, a highly specialized piece of equipment may be so tremendously profitable that it will pay for itself in one year's time, or even on one big job. It is up to the man who makes important decisions to consider all of the known facts and conditions, and then try to shrewdly guess the future probabilities and trends, and finally act to the best of his good judgment.

Paint, Varnish and Lacquer Sales Up More Than 10%

According to the U. S. Department of Commerce figures, released on July 1, the total sales of paint, varnish and lacquer products for the month of May, as reported by 586 manufacturers, were more than 10% greater than the corresponding sales for May, 1934. This rate of increase over last year's sales has been maintained for five consecutive months, the greatest gain having been in February. Charts show that each year the line of sales begins to ascend upward at the very steep angle of about 60° in February, and continues at about the same angle until the peak is reached in May or June. Total sales for the first five months of this year amount to more than 141½ millions of dollars.

We might add that regardless of all the complaints, fault-finding and dissatisfaction that may be voiced and printed in some quarters, it is evident that business in general is getting considerably better and that the improvement is going to continue.

ULTRA RAY PEARL ESSENCE

THE ESSENCE OF PERFECTION

ULTRA RAY PEARL ESSENCE

HIGHEST STANDARD OF BRILLIANCE

Write for booklet history and use of Ultra Ray Pearl. Let our technical staff show you how to improve your product with a rich Ultra Ray Pearl Finish.

ULTRA RAY PEARL ESSENCE CORP. BELLEVILLE, NEW JERSEY

Letters from I. F. Readers

(Continued from page 7)

strument has been considerably improved with a complete color analysis of the entire make-up of every shade given in percent by which colors may be identified, put on record, and the exact percent made at two different points in the country with the instrument, which will give a match. This is something entirely new and has not been heretofore available to the public.

A table or chart of this method of arriving at results, and a description of its use in checking liquids and powders could be furnished if you care to have further information on this new instrument.—M-R-H Laboratories, Dowagiac, Mich.

New Solvents for Stains

I read in March, 1935, issue of Industrial Finishing an article on "Stains for Wood" (pages 26 and 28) and I am interested in finding out where I can purchase some of the "new solvents" for water-soluble dyes—to be used instead of water.—Nancy Cook, Val-Kill Shop.

Faucet Cans

Could you tell us the name of a firm that sells cans fitted with faucets—faucet cans in which to keep finishing liquids?—Nancy Cook, Val-Kill Shop.

Roller Coating

Will you please advise me who manufactures equipment for rolling enamels onto flat wood surfaces? Also, advise where I can secure printed information regarding the application of rolled finishes. If there is any one here in New York that has the above information or machines, I would especially appreciate their addresses.—B. M. R.

Bleaching Compounds

In the June issue of Industrial Finishing Magazine we read an article on page 6 entitled "Bleaching Color From Wood." At the bottom of this article there is an Editor's Note which says: "A number of good bleaching materials are on the market, and in letters replying to the above inquiries we are listing the names of the manufacturers of these materials."

We would be pleased to have you send us the names of the manufacturers of these bleaching materials, and we would also appreciate any comments which you may have at hand regarding the reliability of these products.—B. A. R. Co. (Butchers' Supplies).

Walnut Colors in Lacquer

Would like to know what kind of walnut colors I could get that are soluble in lacquer thinner.—S. A. F.

To Bleach Walnut Veneers

We are very eager to obtain, if possible, a bleaching action on walnut veneer. What we would like to accomplish would be to bleach rotary-cut walnut veneer to as light a color as possible, and then apply a finish over it. Have you any information or suggestions? Could you give us the names of any other concerns or laboratories that might give us information on this problem?—L. R. Co. (High Grade Varnishes).

Novelty Finishes Wanted

I would thank you very much for information about manufacturers of the following products mentioned in January, 1935, issue: Marble and wood-grain decalcomania, Tortoise Shell finish, Crystal finish, Morocco finish, Spedene Wrinkle finish, Shrivel finish, Floxol finish. This is asking a lot, but I certainly would appreciate this information, as our line is novelties.—Carter Novelty Works.

Lacquer Refinish Trouble

We are refinishing furniture chiefly in lacquer, and we have plenty of trouble. For years we refinished furniture with varnish finishes, with very satisfactory results. We have changed to lacquer because so many of the furniture finishes are lacquer. . . . We have trouble producing the depth in our finish that we did in varnish. We are using a well known make of lacquer, and some flat lacquers for the last coat when dull is desired.

We also have trouble with the lacquer bridging in grooves and corners, but the main thing we would like to

solve is how to get a smooth, well-covered surface, with the grain well filled, without using an unreasonable amount of material. We have comparatively little trouble with orange peel or blushing. Suggestions as to information about better materials for our particular work will be appreciated.—G. & I. Co.

Porcelain Finish Repair

With reference to the inquiries which appeared in your May issue regarding a Porcelain Cement for repairing damaged enamel table tops, etc., one of our Licensees has asked us to obtain what information we can from you regarding this material, as he would very much like to obtain supplies in this country.—Oxvar Limited, London, England.

Graining Rolls

We have a graining machine made by . . . . to whom we have written for information, but in case this firm is no longer in business, maybe you can tell us where we can obtain or have rolls made for graining various woods. We would appreciate an early reply and—if we are permitted to say so—a definite reliable one. We are a bit skeptical of all these blind alleys we have been sent up, and would welcome a real guide.—R. F. & P. Co. (Enameling & Plating).

Fashion's Fall Colors

The regular edition of the 1935 *Fall Silk Card*, showing 56 colors, has just been released to members of the Textile Color Card Association. In addition to the two highlighted features, *"Crushed Pastels"* and *"Arabian Nights,"* the card portrays outstanding basic shades especially arranged in the card with lighter tones to suggest the smartest color harmonies and contrasts. In the basic group are several important shades in keeping with the Italian Renaissance influence in fashion.

Foremanship Book

Paper bound, 60-page process-printed manual for development of supervisory forces. $1.00 a copy (net) or prepaid if money accompanies the order. Published by Industrial Relations Dept., Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

The importance of supervisory forces in the present-day industrial organization emphasizes the need for the adequate and simplified plan for the training of foremen and other supervisors, contained in the manual "Foremanship Development." The manual is based upon the experience of the Westinghouse Electric and allied companies, and that of others who have been active in supervisory training. It is intended for both group leaders and the members of conference groups.

"Chemical Formulary," Vol. II, Is Now Ready

So many who have benefited from Vol. I of THE CHEMICAL FORMULARY will be glad to know that Vol. II is now ready.

This new volume covers the entire field of practical chemical compounding. It is entirely new and not a revised edition. Not one formula that occurs in Vol. I is repeated in Vol. II.

Thousands have saved time, labor and money by consulting Vol. I regularly. Ninety percent of our leading manufacturers, consultants, colleges and technical workers have Vol. I, and many have placed standing orders for future volumes.

By having both Vol. I and II, you have at your fingertips the latest boiled down information compiled by over 250 chemists, engineers and technical workers.

Air-Conditioning Business of Westinghouse

The Westinghouse Electric & Mfg. Co. announces transfer of the Air-Conditioning Department from East Pittsburgh, Pa., to Mansfield, Ohio, where it becomes a part of the Merchandising Division. The Company's air conditioning program will be enlarged and expanded.

The engineering and manufacturing of air-conditioning products will be centered at the East Springfield, Mass. plant.

Potter Chosen Director of Pangborn Corporation

P. J. Potter, former 2nd Vice President, was elected a director and vice president of the Pangborn Corporation, Hagerstown, Md., according to a bulletin issued July 1st by Thomas W. Pangborn, president and general manager. Mr. Potter, who will be di-